

CLAIMS:

1. A toilet system comprising:
 - a cistern for containing flush water;
 - 5 a toilet having a bowl, the bowl having one or more apertures which are in fluid communication with a water intake aperture of the toilet and through which flush water flows when the toilet is flushed;
 - a conduit for transporting flush water from the cistern to the water intake aperture; and
 - 10 a gas removal device positioned around the conduit and defining an inner aperture through which the conduit passes, there being a peripheral space between the exterior of the conduit and an inner surface of the inner aperture, and the gas removal device being operable to suck gas into the device through the inner surface of the inner aperture.
- 15 2. A system according to Claim 1, wherein the gas removal device comprises an interface portion which is positioned around the conduit, the interface portion being provided with a pair of seals to seal the interface portion to the toilet and to the water tank.
- 20 3. A system according to Claim 1 or 2, wherein the gas removal device comprises a liquid detection mechanism to detect the flow of liquid through the conduit and cease the sucking of gas into the device upon such detection.
- 25 4. A system according to Claim 3, wherein the liquid detection mechanism comprises a pair of electrically conductive contacts, having a gap defined therebetween, mounted on an arm such that the contacts are in a flow path of liquid carried by the conduit, an electrical connection between the contacts being made by the presence of water in the gap between the contacts.

5. A system according to Claim 3 or 4 wherein, following the ceasing of sucking of gas into the gas removal device due to the detection of a flow of liquid through the conduit, the sucking of gas into the gas removal device is resumed once no more liquid is detected flowing through the conduit.

6. A system according to any preceding claim, further comprising a use detection mechanism to detect use of the toilet and activate the gas removal device in response to such detection.

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7. A system according to Claim 6, wherein the use detection mechanism comprises a pressure sensor operable to detect the weight of a person using the toilet.

15 8. A system according to Claim 6 or 7, wherein the use detection mechanism comprises a wireless connection to the gas removal device.

9. A system according to any one of Claims 6 to 8, further comprising a timer mechanism operable to deactivate the gas removal device after a predetermined time has elapsed following a time when the detection mechanism detects that use of the toilet has ceased.

10. A system according to any preceding claim, further comprising a conduit for guiding gas removed by the gas removal device and feeding the removed gas into a soil stack of the toilet system.

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11. A system according to Claim 10, further comprising a one-way valve which allows the removed gas to be fed into the soil stack from the conduit but prevents gas from entering the conduit from the soil stack.

12. A system according to Claim 11, wherein the one-way valve comprises a flexible diaphragm which blocks an aperture in the valve when gas attempts to flow from the soil stack to the conduit but distorts to allow gas to flow from the
5 conduit to the soil stack.

13. A system according to any preceding claim, wherein an internal diameter of the inner aperture is at least 6.3 cm.

10 14. A system according to any preceding claim, wherein the gas removal device comprises one or more batteries to provide power to the gas removal device.

15 15. A system according to Claim 14, wherein the one or more batteries are rechargeable.

16. A system according to any preceding claim, further comprising one or more turbines adapted to be located in an area of the toilet experiencing, in use, a fluid flow, the flow of fluid past the one or more turbines producing power,
20 and a connector to supply power so produced to the gas removal device or a battery thereof.

17. A system according to any preceding claim, wherein the gas removal device comprises a body that is adapted to fit closely to a portion of the toilet, a
25 part of the body having variable length.

18. A system according to Claim 17, wherein the part of the body having a variable length comprises a hollow, corrugated, flexible portion.

19. A toilet system comprising:

a toilet having a bowl, the bowl having one or more apertures which are in fluid communication with a water intake aperture of the toilet and through
5 which flush water flows when the toilet is flushed;

a cistern for containing flush water, the cistern having an outlet through which flush water is ejected when the toilet is flushed, the cistern and the toilet being arranged such that, when flush water is ejected from the cistern through the outlet thereof, a flow of flush water follows a flow path and is received
10 through the water intake aperture of the toilet; and

a gas removal device having an inner aperture, the gas removal device being positioned around the flow path such that the flow path passes through the inner aperture and, when water flows along the flow path, an air gap exists between an inner surface of the inner aperture and an exterior of the flow.

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20. A system according to Claim 19, wherein the diameter of the inner aperture is at least 6.3 cm.

21. A gas removal device for use with a toilet system comprising a toilet
20 having a bowl, the bowl having one or more apertures which are in fluid communication with a water intake aperture of the toilet and through which flush water flows when the toilet is flushed and a cistern for containing flush water, the cistern having an outlet through which flush water is ejected when the toilet is flushed, the cistern and the toilet being arranged such that, when
25 flush water is ejected from the cistern through the outlet thereof, a flow of flush water follows a flow path and is received through the water intake aperture of the toilet, the gas removal device:

defining an inner aperture;

being adapted to be positioned around the flow path such that the flow path passes through the inner aperture and, when flush water flows through the flow path, an air gap exists between an inner surface of the inner aperture and an exterior of the flow; and

5 being operable to suck gas into the device through an inner surface of the inner aperture.

22. A device according to Claim 21, wherein an internal diameter of the inner aperture is at least 6.3 cm.

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23. A gas removal device for removing gas from the bowl of a toilet, wherein:

the device comprises an interface portion defining an aperture through which a flow path of flush water may pass;

15 the device is operable to suck gas into the device through an inner surface of the interface portion; and

the device comprises a liquid detection mechanism to detect the flow of liquid through the aperture and cease the sucking of gas into the device upon such detection.

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24. A device according to Claim 23, wherein the liquid detection mechanism comprises a pair of electrically conductive contacts, having a gap defined therebetween, mounted on an arm, an electrical connection between the contacts being made by the presence of water in the gap between the contacts.

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25. A device according to Claim 23 or 24, further comprising a use detection mechanism to detect use of the toilet and activate the gas removal device in response to such detection.

26. A system according to Claim 25, wherein the use detection mechanism comprises a pressure sensor operable to detect the weight of a person using the toilet.

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27. A system according to Claim 25 or 26, wherein the use detection mechanism comprises a wireless connection to the gas removal device.

28. A system according to any one of Claims 25 to 27, further comprising a
10 timer mechanism operable to deactivate the gas removal device after a predetermined time has elapsed following a time when the detection mechanism detects that use of the toilet has ceased, or after a predetermined time has elapsed following the initial activation of the gas removal device.

15 29. A system according to any one of Claims 23 to 28, further comprising a conduit for guiding gas removed by the gas removal device and adapted to feed the removed gas into a soil stack of the toilet.

30. A system according to Claim 29, further comprising a one-way valve
20 which allows the removed gas to be fed into the soil stack from the conduit but prevents gas from entering the conduit from the soil stack.

31. A system according to Claim 30, wherein the one-way valve comprises a
flexible diaphragm which blocks an aperture in the valve when gas attempts to
25 flow from the soil stack to the conduit but distorts to allow gas to flow from the conduit to the soil stack.

32. A system according to any one of Claims 23 to 31, wherein an internal diameter of the aperture is at least 6.3 cm.

33. A system according to any one of Claims 23 to 32, wherein the gas removal device comprises one or more batteries to provide power to the gas removal device.

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34. A system according to Claim 33, wherein the one or more batteries are rechargeable.

35. A system according to any one of Claims 23 to 34, further comprising:

10 one or more turbines adapted to be located in an area of the toilet experiencing, in use, a fluid flow, the flow of fluid past the one or more turbines producing power; and

a connector to supply power so produced to the gas removal device or a battery thereof.

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36. A system according to any one of Claims 23 to 35, wherein the gas removal device comprises a body that is adapted to fit closely to a portion of the toilet, a part of the body having variable length.

20 37. A system according to Claim 36, wherein the part of the body having a variable length comprises a hollow, corrugated, flexible portion.

38. A gas removal device for removing gas from the bowl of a toilet, the device comprising:

25 one or more turbines adapted to be located in an area of the toilet experiencing, in use, a fluid flow, the flow of fluid past the one or more turbines producing power; and

a connector to supply power so produced to the gas removal device or a battery thereof.

39. A method of adapting a toilet system, the toilet system initially comprising a toilet having a bowl, the bowl having one or more apertures which are in fluid communication with a water intake aperture of the toilet and
5 through which flush water flows when the toilet is flushed and a cistern for containing flush water, the cistern having an outlet through which flush water is ejected when the toilet is flushed, the cistern and the toilet being arranged such that, when flush water is ejected from the cistern through the outlet thereof, a flow of flush water follows a flow path and is received in the water intake
10 aperture of the toilet, the method comprising the steps of:

providing a gas removal device, the gas removal device defining an inner aperture and being operable to suck gas into the device through an inner surface of the inner aperture; and

positioning the gas removal device around the flow path such that, when
15 flush water flows along the flow path, an air gap exists between the inner surface of the inner aperture and an exterior of the flow.

40. A system substantially as hereinbefore described, with reference to the accompanying drawings.

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41. A gas removal device substantially as hereinbefore described, with reference to the accompanying drawings.

42. A method substantially as hereinbefore described, with reference to the
25 accompanying drawings.